Device/User Interface Software Requirements For HP E1366A RF Matrix Switch

Version 1.0

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1.0 Introduction

This document provides device and user interface requirements for the Hewlett Packard Model E1366A 50 ohm RF Multiplexer Switch.

2.0 Required Functionality

Required Functionality of the Test & Command matrix at SGS and AGS:

The Model E1366A 50 ohm RF Multiplexer cards are used to route low level as well as high level analog and RF signals that must operate without distortion or interference over a very wide frequency range. These switch banks provide the required isolation to the adjacent channels that is not available in a cross point matrix. Four cards are mounted in a E1301A mainframe for control and cables are connected to make the proper signal routing that often requires routing through multiple switch banks so that alternate signals can also be routed to the same locations.

For real-time support the inputs selected by the switch banks are Programmable Telemetry Processor (PTP) commands received from NASCOM via IP transmission. The command signals are routed by these switch banks to the PSK modulator input. The PSK modulator output is routed by these switch banks to the Up-link Control Unit that is connected to the exciter in the antenna pedestal. Switching allows selection of different PTP units, different PSK modulators and different Up-link Control Unit channels as needed.

For pre-operation verification of the ground station equipment the inputs selected by these switches may be the bit error rate test set, the PCM simulator, the Forward Error Correction Encoders in the bit synchronizers or any of the PTP's. These inputs may be routed to the PSK modulator input, directly to the high rate channel input of the Up-link Control Unit or directly to the test inject signal generator in the antenna pedestal. The test inject signal generator is also selectable as an up-link exciter. These switch banks also provide routing to the analog matrix to permit testing of individual down-link equipment.

The switch will be connected to and controlled by the Data Handling Node. It will be wired, via patch panels, to the input and output devices. The device functions, OPEN and CLOSE, will be required by the automated tracking station.

3.0 Parameter Ranges

The parameter ranges will not differ from the device's capabilities.

4.0 Communications Protocol

The switch communicates with the controlling computer using the RS-232 proprietary protocol (see HP E1300A, VXI mainframe manual, figure C-1, page C2). The switch will be directly connected to the controlling computer with a serial cable.

5.0 GUI Functionality

The user interface will include one interactive and one static window. The Status window will display the current connections of the switch. The Settings window will provide options with which the user can route input devices to appropriate output devices.

6.0 Command Scripting

See Appendix B: Scripting Requirements

7.0 High-level Status

The switch does not provide any information that is useful as a real-time status, therefore there is no real-time status information to be gathered and displayed. In lieu of a real-time status, the high-level status window will display the input-to-output connections of the switch.

8.0 Replacement Algorithm

There is only one switch therefore it cannot be replaced with a backup.

If a device on the output side of a chain is signaling an error then the switch's connection may be at fault. If the switch indicates a bad connection then the error condition will be brought to the attention of the operator who will have to replace a circuit card.

Appendix A: Graphical User Interface Requirements

There is no additional information.

Appendix B: Scripting Requirements

Master	Node	Comments/Error Handling

Resource Request Specific
Parameter: unit number
	Start
	
	Check allocation table for unit number
	
	If available then
	Mark unit as assigned to this Master
	Reply “Unit # assigned”
	Open log file
	Retrieve configuration file from this Master
	Else
	Reply “Unit # not available”
	End
	
	Stop
		There is only one Hewlett Packard Model E1366A 50 ohm RF Multiplexer Switch. Therefore the request will always be for the same switch.

Resource Request General	Start
	
	Check allocation table for an available unit using the least recently used method
	
	If available then
	Mark unit as assigned to this Master
	Reply “Unit # assigned”
	Open log file
	Retrieve configuration file from this Master
	Else
	Reply “No units available”
	End
	
	Stop	

Setup Parameter: unit number	Start Verify possession of unit by this Master	

Master	Node	Comments/Error Handling

	If not assigned to this Master then
	Inform this Master
	Stop
	End
	
	Load and Verify configuration file
	
	If configuration file error then
	Inform this Master
	Stop
	End
	
	Stop
		>> Operator intervention required
		
		>> Operator intervention required

Start Support Parameter: unit number	Start Verify possession of unit by this Master If not assigned to this Master then Inform this Master Stop End Stop	>> Operator intervention required
Stop Support Parameter: unit number	Start Verify possession of unit by this Master If not assigned to this Master then Inform this Master Stop End Stop	>> Operator intervention required
Takedown Parameter: unit number	Start Verify possession of unit by this Master	

Master	Node	Comments/Error Handling
	If not assigned to this Master then Inform this Master Stop End Mark unit as not assigned Close log file Send log file to this Master Stop	>> Operator intervention required